Edward Stirling. He was born in 1848, and his early education was obtained at St. Peter's College, Adelaide. Later he went to Trinity College, Cambridge, where he took honours in natural science. He completed his medical education at St. George's Hospital, where he later occupied the positions of house surgeon, assistant surgeon, teacher of operative surgery, and lecturer in physiology. He became a F.R.C.S. in 1874. In 1877 he married the eldest daughter of the late Joseph Gilbert, of Pewsey Vale, and four years later returned to Australia. Sir Edward's activities in Adelaide, where he spent the remainder of his life, were manifold. For a time he practised surgery, and became a surgeon at the Adelaide Hospital and lecturer in surgery at the University. From 1883 to 1886 he was member for North Adelaide in the House of Assembly. In 1887 he presided over the Section of Surgery at the Second Intercolonial Medical Congress. In 1889 he was president of the South Australia branch of the British Medical Association, and in the following year held the presidency of the Royal Society of South Australia.

Most of Sir Edward's scientific work was published in the period 1888–1902, during which time he wrote several interesting articles for NATURE. His interests were many, and he made important contributions to science in zoology, palæontology, and anthropology. His best-known work was on the marsupial mole (*Notoryctes typhlops*) (1888), on the anatomy of the female organs of generation of the kangaroo (1889), and various important observations on remains found at Lake Callabonna, which were published between 1893 and 1902, and concerned Diprotodon, *Genyornis newtoni*, and *Phascolonus gigas*. In 1894 he accompanied as ethnologist the Horn Scientific Exploration Expedition to Central Australia. He was made a fellow of the Royal Society in 1893, created C.M.G. in the same year, and for his services to science received a gold medal from the Queen of Holland. He was knighted in 1917.

Among the numerous institutions in Adelaide with which Sir Edward was associated there are two that owe much to his energy and ability—the University, where he was lecturer, and afterwards professor, of physiology, and the South Australian Museum, of which he was for many years director. His death will be deeply felt by a wide circle of people who knew him as a vigorous and kindly personality and as a staunch and loyal friend.

C. H. K.

NOTES.

THE *Berliner Tageblatt* announces that Herr Hans Bredow, an engineer who was formerly a director of the Telefunken Co., has been appointed Director-General of the Imperial Postal Department, and at the same time it directs attention to the fact that this is, so far as it knows, the first occasion on which a position held in Germany, as a rule, by lawyers and bureaucrats has been filled by the appointment of an engineer. Whilst it is true that since the institution of the Reichspostamt, on January 1, 1880, as the Imperial Department responsible for posts and telegraphs no engineer has occupied the chief administrative position of Secretary of State (the former title of the permanent head of the Department), on the other hand it has to be borne in mind that technically trained men have, from the earliest days of telegraphy in Germany, held important administrative posts in the Telegraph Department. For instance, the members of the Commission for the Administration of the State Telegraphs, appointed in Prussia in March, 1849, to carry on the telegraph services, consisted of an artillery colonel as chairman, and of an engineer and a postal inspector. In later times many of the important administrative posts in the Reichspostamt have always been held by technically trained men. It can be said generally that on the continent of Europe there has at all times existed a greater appreciation of the technically trained man in the public services than is the case in this country. Many instances could be quoted of engineers holding, on the Continent, the chief administrative positions in the public Departments, such as railways, posts and telegraphs, etc., wherein the work is largely of a technical nature. The example of foreign countries could in this respect be followed with great advantage to the public services in this country.

THE rumours for some time current that Sir Robert Morant was to take the chief post at the new Ministry of Health have proved to be correct. Taking advantage of the approaching retirement of Sir Horace Monro, Permanent Secretary to the Local Government Board, Dr. Addison has appointed Sir Robert Morant an additional Secretary to that Board, and has designated him First Secretary of the Ministry of Health, when formed. Secretary to the Board of Education when the changes rendered necessary by the introduction of school medical inspection were made, and first chairman of the National Health Insurance Commission, Sir Robert Morant seems fated to be called upon to play a prominent part when organisation or reorganisation is needed. That he is well fitted for the task is certain. There are, however, other advantages than those arising from his own qualifications attending the appointment of Sir Robert Morant. Associated with him in his work he is to have Sir George Newman as Chief Medical Officer and Mr. John Anderson as Second Secretary. Both these gentlemen have worked with Sir Robert Morant before, Sir George Newman at the Board of Education, where he was Medical Officer, and Mr. Anderson at the Insurance Commission, where he acted as secretary. It was inevitable, no doubt, that the chairman and secretary of the National Health Insurance Commission and the Medical Officer of the Board of Education should be accommodated at the Ministry of Health, but it is fortunate for Dr. Addison that the holders of these positions should be such men as those named.

THE number of clinical themometers tested at the National Physical Laboratory since the introduction of the Clinical Thermometer Order of October last has this week reached the total of half a million. The equipment for carrying out this work at Teddington has been increased to such an extent that the number of instruments tested per week is considerably in excess of those dealt with in any year under the older conditions for the certification of clinical thermometers. At the present time it is found that the number of clinical thermometers which do not comply with the provisions of the Order amounts to about 4 per cent. of the total received. The proportion, however, varies greatly for the different makers; for one firm, the output of which is large, the average number of rejected instruments has exceeded 25 per cent. for some time past. Further, of the numerous stocks of clinical thermometers which have been received from chemists and stores throughout the country, the number of unsatisfactory instruments falls between 9 and 10 per cent. It is of interest to note that the French Government has recently issued a decree rendering compulsory the testing of all clinical thermometers sold in France. The limits of error adopted are in agreement with those in force in this country, but the French decree very considerably restricts the types of instruments which may be offered for sale.

AT a special general meeting of the Geological Society, held on March 26, the following resolution of council was carried by 55 votes against 12 :—"That it is desirable to admit women as fellows of the society." In submitting the motion, Mr. G. W. Lamplugh, president of the society, said :—"It will be within the recollection of most of the fellows that the question of the admission of women to candidature for the fellowship of the society has been raised on more than one occasion in the past. It was considered in 1889 and 1901, and, again, more systematically in 1908–9, when a poll of the fellows was taken and three special general meetings were held, with inconclusive results. It is generally recognised that the course of events since these dates has materially changed the situation. Women have been welcomed to our meetings as visitors, and we have had many examples of their qualifications for fellowship in the excellent papers which they have from time to time contributed to the society. The value of these papers has been appreciated by all geologists, and has been repeatedly acknowledged by the council in its awards. Therefore, in the opinion of the council, it is no longer reasonable to maintain a sex-bar against qualified candidates for the fellowship of the society, and I am empowered by the council to submit the above-mentioned resolution for your consideration."

AT a meeting of the Royal Microscopical Society on March 19 Lt.-Col. Clibborn made a proposition that the society should at once take measures to design and specify the British standard microscope. He suggested that (1) the stand should be designed, not as a concrete whole, but so as to admit the successive additions of other standard parts; (2) all fittings, other than optical, should be standardised; (3) each part should be made of the material best suited to the strains and wear it has to undergo; and (4) the design should aim at simplicity, a balance of the moving body in all positions, perfect rigidity, uniformity of movement round the arc traversed by the moving body, and artistic finish. It should not require clamping. Attention was directed to aluminium-bronze and rubel-bronze as materials more suitable than brass to secure rigidity for the stand; also to die-casting as a means of producing castings in unlimited number, and requiring little or no machinery. The manufacture should be carried out by precision tools and precision grinding to limit gauges, so that all the parts of all instruments would be interchangeable. It is to be noted that in 1916 a committee of the British Science Guild drafted full specifications for six types of microscopes (see Journal of the British Science Guild, January and November, 1916). This does not appear to be referred to by Col. Clibborn.

THE trustees of the British Museum have decided that henceforth for the rest of his official career Mr. C. E. Fagan's title shall be Secretary of the Natural History Departments, British Museum.

WE regret to announce the death on March 29, at eighty-six years of age, of Dr. Henry Wilde, F.R.S., distinguished by his work in applied electricity and other branches of physics.

THE annual meeting of the Iron and Steel Institute will be held on Thursday and Friday, May 8 and 9. On the opening day the Bessemer medal for 1919 will be presented to Prof. Cav. Federico Giolitti, of Turin.

THE Silvanus Thompson memorial lecture of the Röntgen Society will be delivered by Prof. W. M. Bayliss on Tuesday, May 6, at the Royal Society of Medicine. The subject will be "The Electrical Changes in Active Tissues."

ACCORDING to a paragraph in the *Times* Trade Supplement for March 29, the National Council of Scientific and Industrial Research in Canada has proposed, with the approval of the Dominion Government, to establish a Scientific Research Bureau on the lines of the Bureau of Standards at Washington.

AT the annual general meeting of the Chemical Society, held on March 27, Sir James J. Dobbie was elected as president in succession to Sir William J. Pope, Dr. H. J. H. Fenton and Prof. James Walker were elected as vice-presidents, and the new ordinary members of council are Prof. F. E. Francis, Mr. J. Addyman Gardner, Dr. C. A. Keane, and Sir Robert Robertson.

APPLICATIONS are invited by the Royal Society for the two Mackinnon research studentships which are awarded annually for research in (1) astronomy, chemistry, geology, mineralogy, and physics, and (2) anatomy, botany, palæontology, pathology, physiology, and zoology. The scholarships are each of the value of 150*l*. Applications must be received not later than June 1.

SUMMER time in Great Britain came into force on Sunday, March 30, and will continue until the night of September 28–29 next. In Canada a motion to institute summer time this year was defeated in the Dominion House of Commons on March 27, while the British Columbia Legislature has passed a Daylight Saving Bill, operative from March 29. Much confusion must result from these different decisions. The railways of Canada have put summer time into operation, and so have the chief cities and towns, but in rural districts the old standard will be maintained.

WE learn from *Science* that Mr. Secretary Lane has appointed a Commission of mining and metallurgical experts to visit Europe to observe and assist reconstruction methods in the devastated regions of France and Belgium. The members of the Commission are Dr. F. G. Cottrell, chief metallurgist of the U.S. Bureau of Mines (chairman); Mr. G. S. Rice, chief mining engineer of the Bureau; Prof. F. H. Probert, consulting engineer of the Bureau and professor of mining in the University of California; Mr. R. H. Cameron, consulting chemist of the Bureau, and Mr. H. S. Gale, of the U.S. Geological Survey.

IN accordance with the express wish of the late Dr John Foulerton, his executrix and sole legatee has transferred to the Royal Society 20,000*l*. National War Stock, the interest upon which is to be employed by the president and council in making awards to students, especially younger students, of sufficient amount to enable them to devote themselves, under the supervision and control of the president and council, to original research in medicine, to the improvement of the treatment of disease and the relief of human suffering. All awards are to be subject to the conditions that members of both sexes are to be equally eligible, and that every candidate must show that he or she and his or her father and paternal grandfather are of British nationality; but, subject to these conditions, the awards may be made by the president and council in such manner and upon such terms and conditions as they may from time to time determine at their discretion.

By the untimely death of M. Jacques Danne, announced in last week's Nature, science loses one of its earliest workers in radio-activity. M. Danne was associated with Prof. Curie in researches upon the physical properties of radium emanation and the active deposit therefrom; they found the law of decay of the latter when a body is exposed for a long time to the emanation, and recognised that a complex series of events was here in operation. M. Danne was the director of the laboratories at Gif, which are a model of their kind. They consist of a number of small buildings designed to serve the purpose of radio-active research, and to provide the accurate measurements and chemical analyses required in the process of extraction of radium from the crude ore; this latter is carried out in a factory near by. The laboratories possess a library which contains copies of practically all the purely scientific work published upon radium and allied substances. M. Danne was the editor of *Le Radium*, the only journal of its kind dealing with all the aspects of the physical and chemical properties of the radio-active bodies. He was a man of extraordinary energy, and accomplished work of much value in radio-active fields.

A further paper on the etiology of influenza by the late Major Graeme Gibson, in association with Major Bowman and Capt. Connor (see Nature, March 13, p. 31), is published in the *British Medical Journal* for March 22, p. 331. The experiments recorded consisted of (1) the inoculation of animals with sputum from cases of influenza, (2) the inoculation of animals with blood from cases of influenza, (3) passage of the virus from animal to animal, and (4) cultural experiments and inoculation of cultures into animals. Of five monkeys inoculated with sputum collected at an early stage of the disease and filtered through a filter-candle, four gave positive results and one was negative. Positive results were also obtained with some rabbits and guinea-pigs, but not with mice. Experiments with blood were not very successful. The pathological lesions in the experimental influenza in the animals closely resembled those seen in the lungs of man. A minute coccoid micro-organism was grown by Noguchi's cultural methods from (*a*) the kidney of infected animals, (*b*) the filtrates of lung-tissue, and (*c*) the filtered sputum from cases of influenza. In view of these findings, the authors conclude that the organism isolated is capable of passing through a filter-candle, and that it is, in all probability, the cause of influenza as seen to-day.

March closed with very wintry conditions over the British Isles, frost and snow occurring generally. During the early hours of Saturday, March 29, the heaviest snowstorm of the winter was experienced. In Scotland railway traffic was delayed, and the fall of snow is said to have been the heaviest experienced for years over the Irish midlands and the west. The snowstorm was due to the passage of a subsidiary cyclonic disturbance up the English Channel. Very heavy snow fell in London from 2.30 to 7 on Saturday morning, the depth amounting to 9 in. in some of the metropolitan suburbs, and at some places in the South of England the depth exceeded a foot. Snow has often fallen later in the winter or spring, and in 1917 much snow fell both in March and April. At Greenwich the latter half of March was 7° colder than the first part of the month. The mean temperature for the whole of March was 40·9°, which is 1° below the average for seventy-five years to 1915. It is 2° colder than March, 1918, but 2·4° warmer than March, 1917. Frost was registered on the grass this year at Greenwich on twenty-four nights, and with only one exception after March 12. The total rainfall for the month measured 2·91 in. (to the evening of March 31), which is exactly double the sixty years' average. The duration of bright sunshine during the month was eighty-nine hours, and there were only six sunless days.

Some disconcerting possibilities are indicated in some notes by Mr. A. Philpott on birds introduced into Southland, New Zealand, which appear in the *New Zealand Journal of Science and Technology* (vol. i., No. 6). According to the author, in this district the introduced birds are now "much more prominent than the native birds." Some of the latter, he assures us, are still plentiful enough, and will probably continue to hold their own. It is devoutly to be hoped that this surmise will prove to be correct. But the dispossessed species can never be replaced, and they were infinitely the more valuable. Among the introduced species Mr. Philpott makes special mention of the starling, which, we are informed, is a useful bird, but not nearly so plentiful as it used to be. As it seems to be changing its nesting habits, there is a grave danger that a reversal of its rate of increase will in the near future have to be recorded. The Australians have learnt, by bitter experience, the folly of introductions of this kind. There the starling has become a pest, defying all attempts to reduce its numbers.

Anatomists and palæontologists will indeed be grateful for the studies in comparative myology and osteology which Messrs. W. K. Gregory and C. L. Camp have just published in the Bulletin of the American Museum of Natural History (vol. xxxviii., art. 15). Not only have the authors given a very exhaustive account of the muscles of the shoulder girdle and pelvis in a number of reptiles, birds, and mammals, and the homologies of these muscles; they have also essayed the difficult task of reconstructing the musculature of a number of primitive fossil reptiles. Only those who have some practical acquaintance with dissections of this kind can appreciate the immense amount of labour which they must have expended to produce results so striking. A large number of very beautiful diagrams add still further to the value of this work, of which they may be justly proud.

In the report on the Agricultural Department, Grenada, 1917–18, an account is given of further experiments with a parasitic fungus, *Sporotrichum globuliferum*, on the cacao thrips (*Heliothrips rubrocinctus*). The trees were sprayed with a powdered mixture of flour and fungus-spores suspended in water in the proportion of from 20 to 60 grams of the powder to 3½ gallons of water. The observations are not yet complete, but the experiment has demonstrated (1) that the fungus was readily distributed amongst thrips in the field, (2) that under favourable conditions of atmospheric humidity the fungus caused the death of large numbers of both young and adult thrips on the inoculated trees, and (3) that the fungus spread by natural agencies to trees outside the inoculated area. It remains to be determined whether adequate control of thrips can be secured by the use of this fungus, and how far the activity of the fungus is limited by climatic conditions; there is also the question as to the economic production of inoculating material in quantity.

A SEVERE earthquake was felt over eastern Bengal and Assam, most of Burma, and in north-east India as far west as Lahore on July 8, 1918. Capt. Murray Stuart, who has investigated the earthquake on behalf of the Geological Survey of India, has published an interesting summary of his results (Records Geol. Surv. India, vol. xlix., 1918, pp. 173–89). Without preliminary warning, the earthquake occurred at about 3.50 p.m. (Indian standard time), at a time when most people were out of doors, so that the loss of life was exceedingly small. The epicentral area lies some hundred miles to the south-east of that of the great Assam earthquake of 1897, the centre of this area being in the Balisera Hills, about 3½ miles south of the railway at Srimangal. Nearly all brick buildings were destroyed in the area of greatest intensity, but no fault-scarps were formed, though there was much shifting and fissuring of the surface material and ejection of water and sand. Making use of Dutton's well-known method, Capt. Stuart estimates that the focus was at a depth of eight or nine miles.

IN an article on the progressive desiccation of Africa in the *South African Journal of Science* (vol. xv., No. 3) Mr. E. H. L. Schwarz discusses at length the various hydrographical systems of that continent. Certain engineering works are proposed which the author believes would have a beneficial effect on South Africa. One is a dam across the Cunene River below Kinga, in Angola, some 250 miles from the coast; the other is a dam across the Selinda River or the Chobe River a few miles above its confluence with the Zambesi. These weirs would restore to Lake Ngami its old area, fill up the Etosha pan, and inundate much of the Makarikari depression. This, Mr. Schwarz believes, would result in a greater general humidity which would have the effect of bringing rain to the Kalahari desert; otherwise he foresees desert conditions gradually spreading through South Africa. Possibly Mr. Schwarz takes an unduly pessimistic view of the future of the country, and all authorities do not agree with him in his contention that the agricultural conditions in the Karroo have changed for the worse within recent times. It is open to argument whether the creation of such an immense inland lake would have the desired effect in modifying the climate, even if the scheme were practicable, but the paper is valuable for the facts it contains and the important issues which it raises.

A QUANTITATIVE examination of the relation of rainfall to configuration in certain localities of the British Isles has been made by Mr. Carle Salter, and was the subject of a lecture to the Institution of Water Engineers. The paper is now published by the institution as a separate pamphlet. Rainfall may be classed as convectional, cyclonic, or orographical. The first two types are only slightly affected by configuration of the land, but an examination of a rainfall map of the British Isles shows that orographical rains predominate in the course of the year. In winter orographical rains are most frequent, and in summer their influence, while apparent, is not so well marked. Unfortunately, no records exist of the average amount of rain which falls annually over the sea in the neighbourhood of the British Isles. Records of this nature, if available, would give a measure of the amount of non-orographical rain which falls over the land generally An examination of data from stations near sea-level shows that elevations of only a few feet affect the amount of rainfall. The rate of increase per 100 ft. of altitude varies within wide limits. It is lower on slopes parallel to the prevailing winds than on slopes at right angles. On fairly steep ridges close to the sea the maximum rainfall often occurs slightly on the leeward side of the crest. These and other cases Mr. Salter discusses at length with a wealth of illustration from the records of the British Rainfall Organisation. It is unnecessary to point out the great importance of researches of this nature in relation to problems of water-supply.

THE evidence of complete combustion of coal is to be sought in the flue-gases. According to the *Coal Age* for November 21 last, these gases, when the combustion of the coal is complete, consist in part of carbon dioxide, of which there should be not less than 16 per cent. When the flue-gases show by analysis less than that percentage, too much air has been allowed to pass through the furnace. Even if we admit one-third more air into the fire-box than is theoretically necessary for complete combustion, the escaping gases should contain from 20 to 22 per cent. of carbon dioxide. In practice every pound of coal burned requires for its complete combustion 200 cu. ft. of air. When burned under such conditions, a pound of coal should develop 13,000 B.Th.U.

IN a paper read to the Institution of Electrical Engineers on February 27 Drs. Barclay and Smith discussed the determination of the efficiency of the turbo-alternator. The American Institution of Electrical Engineers gives a conventional theoretical method of computing the losses, but it is known in certain cases to lead to very erroneous results. The authors have found out, by experiments carried out at Messrs. Vickers's works, that the alternator losses can be determined conveniently and accurately under actual load conditions by measuring the amount of heating undergone by the air used for ventilating the alternator to keep it cool. The method is practically the same as that described by Sir Richard Threlfall to the institution in 1903. The main improvements lie in the methods of measuring the quantity and temperature of the air. In the discussion we were surprised to hear that the "stray losses"—that is, the losses not taken into account in the usual conventional way of testing—sometimes amounted to 40 per cent. of the total losses. We should have thought that the cause of this must be fairly self-evident.

A COAL meter for boilers, made by the Lea Recorder Co., Ltd., of Manchester, is described in the *Engineer* for March 14. This meter is intended for boilers fitted with chain-grates. The amount of fuel passing under the fire-door depends upon the depth, *i.e.* the thickness of the fire and the velocity of the fire-grate, and both these variables are taken into account by the mechanism of the meter, which somewhat resembles that of the well-known **V**-notch recorder for water measurement made by the same firm. Tests have been made at the works of Messrs. Browett and Lindley, and are said to be satisfactory. The makers give a guarantee of accuracy to within 5 per cent.

AN illustrated article in *Engineering* for February 28 gives an account of submarines built for the British Navy during the war by Messrs. Vickers. Fifty-four boats in all were built and commissioned in a period of fifty-one months; of these the details of the K type are specially interesting. These vessels have a submerged displacement of 2570 tons, and are 339 ft. long by 26 ft. 8 in. beam. The double-hull principle is embodied in a modified form. The speed is twenty-four knots on the surface, the power being obtained from twin sets of geared steam turbines, which develop a shaft horse-power of 10,500. Steam is obtained from two boilers of the Yarrow type, working at 235 lb. per sq. in. The turbine machinery is supplemented by an 800-brake-horse-power heavy oil engine of the Vickers submarine type, which is coupled to a dynamo of the open single-armature design. The turbines are reserved for higher speeds only, whilst the dynamo, in addition to charging batteries, supplies the main motors with power for cruising at economical speeds. For submerged work the motors develop a total horse-power of 700 per shaft, and give a speed of nine knots. The motors drive the shafts through helical gearing. The storage battery for the use of the motors is divided into three groups of 112 cells per group.

THE following works are in the press for publication by the *Carnegie Institution of Washington*:—"The Cactaceæ: Descriptions and Illustrations of Plants of the Cactus Family," N. L. Britton and J. N. Rose, 4 vols., vols. i. and ii.; "A Biochemic Basis for the Study of Problems of Taxonomy, Heredity, Evolution, etc., with Especial Reference to the Starches and the Tissues of Parent and Hybrid Stocks, and to the Starches and the Hemoglobins of Varieties, Species, and Genera," E. T. Reichert; "A Biometric Study of Basal Metabolism in Man," J. A. Harris and F. G. Benedict; "Distribution of Vegetation in the United States, as Related to Climatic Conditions," B. E. Livingston and F. Shreve; "The Ecological Relations of Roots," J. E. Weaver; and "The Carbohydrate Economy of Cacti," H. A. Spoehr. *Mr. Edward Arnold's* latest announcements include the concluding volume of "Principles of Electrical Engineering and their Application," Prof. G. Kapp; "Air Navigation: Notes and Examples," Capt. S. F. Card; "Tacheometer Tables," Prof. H. Louis; and a revised and enlarged edition of the translation, by Dr. G. W. O. Howe, of Dr. A. Thomälen's "Text-book of Electrical Engineering." *Messrs. Hodder and Stoughton* are publishing "Automobile Repairing made Easy," Capt. V. W. Pagé, and a new edition of the same author's "The Modern Gasoline Automobile: Its Design, Construction, and Operation." *Messrs. Crosby Lockwood and Son* promise "Aeroplane Construction," S. Camm; "Oils, Fats, and Waxes," Dr. G. Martin; "Streamline Kite Balloons," Capt. P. H. Sumner; "The Engineer's Year-Book for 1919"; and a revision, by H. H. P. Powles, of "Clark's Mechanical Engineer's Pocket-Book." *Messrs. Gauthier-Villars et Cie* (Paris) have in preparation part iii. of Prof. E. Rothé's "Cours de Physique," dealing with "Aérodynamique"; vol. iii. of "Œuvres d'Halphen" is in the press for appearance with the same publishers, and vol. iv. is in preparation.

OUR ASTRONOMICAL COLUMN.

COMET 1914*c* (NEUJMIN).—A definitive orbit of this comet is contained in Publication of the Stockholm Observatory, vol. x., No. 6. The comet was discovered on 1914 June 24 by M. Neujmin, of the Simeis Observatory, Crimea, and fifty-one observations on thirty-six nights between that date and December 22, the majority of which were made at Mount Hamilton and Vienna, have been used to determine its orbit. The points that specially call for remark are that the orbit is hyperbolic, the eccentricity being 1·00367 ± 0·000296, and that the perihelion distance is exceptionally large—3·747. In spite of the fact that the arc of the orbit comprehended in the investigation is only 33° or 34°, the author, Mr. John Svärdson, is satisfied that the hyperbolic character of the orbit is real. The large perihelion distance is equalled only by the comet of 1729, and there are other resemblances between the orbits of the two comets—a fact which had been previously noticed. The elements found by Mr. Svärdson are given below with those of the comet of 1729 for comparison.

	1914*c*	1729
T =	1914 July 30·158 Berlin M.T.	1729 June 13·27 Paris M.T.
ω =	14° 2′ 12·5″	9° 53′ 22″
☊ =	270° 18′ 26·7″	310° 38′ 0″
i =	71° 2′ 18·4″	77° 5′ 18″
q =	3·747131	4·043496
e =	1·003672	1·0050334

COMET 1915*a* (MELLISH).—Stockholm Publication No. 5 (vol. x.) contains a definitive orbit of this comet by Mr. Rosenbaum. The orbit seems to be hyperbolic, eccentricity 1·000235, but the author is not satisfied that this is real. It may be remembered that in the middle of May the comet was observed to have two nuclei visibly separated, and Mr. Rosenbaum suggests that it is necessary to treat the observations before and after the disruption as distinct orbits.

THE CEPHEID VARIABLES.—The characteristics of the variable stars of which δ Cephei is the type furnish a problem which is occupying many minds: (1) Their variation is regular and continuous, and the rise to maximum is usually more rapid than the fall to minimum; (2) they show variation of radial velocity with the period of the light changes; (3) their spectral class varies with the period, advancing towards M as the period is longer, and also with the light variation, the stars being redder at minimum than at maximum; and (4) the period of light variation has a marked correlation with the mean absolute magnitude of any star. It is found difficult to propound a hypothesis that will account for these and other characteristics. There is good reason for thinking that the Cepheids are not binary stars. It has been suggested that they are rotating bodies hotter and brighter on one side than on the other, but this fails to fit the facts, and a third hypothesis, known as the pulsation theory, which supposes that the Cepheids are gaseous bodies alternately expanding and contracting is now under discussion. The Monthly Notices of the R.A.S. for November and January contain a thermo-dynamical investigation of this theory by Prof. Eddington, who discusses successfully the initial difficulty that the dissipation of energy would not permit the action to continue, and concludes that the hypothesis leads to results in agreement with observation in respect of (1) the absolute value of the period, which can be determined theoretically with small uncertainty; (2) the correlation of spectral type with absolute magnitude; and (3) the asymmetric form of the velocity curve.

WAR WORK OF BRITISH CHEMISTS.

THE anniversary dinner of the Chemical Society was held at the Connaught Rooms on March 27, Sir William J. Pope presiding. In proposing the toast of the Chemical Society, Lord Moulton stated that our real enemy in the war was Germany—the nation that had devoted itself *par excellence* to chemistry. Germany did not declare war until her installations for the production of ammonia and of nitrates in vast quantities were complete. Emboldened by the enormous preparation made for the supply of munitions, by the advances made in artillery, and by the decision to use poisonous gases, Germany thought she had but to strike a heavy blow and world-supremacy was hers. Lord Moulton then contrasted Germany's state of preparedness in 1914 for the production of munitions with that of England. Chemists were justified in claiming that it was they who had had to resist Ger-